NSW DPI

Fruitwise

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This issue:

NSW DEPARTMENT OF
PRIMARY INDUSTRIES

Editor's Corner

Summer is here again! Check out some of the recipe ideas for sensational summer fruits from the Summerfruit Australia website- a sample has been reproduced on page 3.

Best wishes for the harvest and you all.

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Fruit Platter with Macadamia Praline and Marscapone Cream

Courtesy of Summerfruit Australia
http://www.summerfruitaustralia.com.au/publish/con_recipes.shtml

Ingredients
Selection of summerfruit cut into wedges, eg peaches, nectarines, apricots and plums
Macadamia Praline
¼ cup of water
2oog castor sugar
100g roasted macadamia nuts roughly chopped
Marscapone Cream
125 ml thickened cream
250 marscapone cheese

To make Praline, combine water and sugar in a small saucepan and stir over a low heat until sugar dissolves. Bring to the boil and cook without stirring until golden. Spread nuts over an oven tray lined with baking paper and pour over the caramel. Cool until hard and break into pieces. Process until coarse crumbs form.

To make marscarpone cream, whip cream in a small bowl until peaks form then gradually fold in marscarpone. Stir through three quarters of the praline then spoon mixture into a serving bowl. Top with remaining praline. Serve with fruit wedges.

Serves: 6 Preparation **time:** 10 minutes
Cooking time: 15 minutes

NSW DPI Extension Horticulturists

Commercial fruit growers who require horticultural production or pest and disease advice should contact their nearest horticulturist

Alstonville	Philip Wilk	6626 2450
Camden	Lawrence Ullio	4640 6408
Gosford	Sandra Hardy	4348 1916
Orange	Jeremy Bright	6391 3822
Tumut	Julie Dart	6947 4188
Windsor	Peter Malcolm	4577 0637
Young	Sue Marte	6382 1077

Fruit Drops

Visit by US Cherry and Apple Post harvest Expert

A leading post harvest horticulture extension specialist from Washington State University (USA) will be visiting Australian apple and cherry growers and packers.

Dr Gene Kupferman will be visiting the main cherry and apple growing regions from November to February 2005. He has more than 25 years experience in horticulture and is a world leader in cherry and apple research and extension. He is extension horticulturalist with the Washington State University Cooperative Extension at the Tree Fruit Research and Extension Centre, Wenatchee, WA USA.

Dr Eugene Kupferman
Post harvest Extension Specialist
Washington State University
(USA)

Dr. Kupferman is the state-wide specialist in post harvest of tree fruits in Washington State, which produced 86,000 tonnes of sweet cherries in 2002 (nearly 50% of total USA production, compared to 5,800 tonne total production in Australia), and produces about half the US apple crop worth more than US$1 billion (2002). He will be spending time and visiting local orchards and packing sheds and giving grower talks around Australia. This project has been funded by the apple and pear and cherry levies, facilitated by Horticulture Australia Ltd (HAL) in partnership with APAL and the CGA. The Australian Government provides matched funding for all HAL's research and development activities (Horticulture Australia Limited Project CY04004).

IMPORTANT NOTICE

Change of use pattern for Procymidone products from the APVMA
E.g.: Sumisclex, Cyon, Fortress, Spiral Aquaflow & Procym

As part of the APVMA chemical review process, some uses of procymidone fungicides have been suspended. From the 15th of November 2004 all procymidone products must be used in accordance with new instructions.

Users of procymidone products purchased before 19th November 2004 need to get a new label from their chemical dealer and follow the directions before use.

Changes to the legal use of this product have been made for Turf, Seed Dressing and Horticultural crops. Some of the key changes for horticulture are below:

Uses now prohibited

CROP	***Problem***
Green beans	Sclerotinia
Table grapes or grapes for drying	Botrytis
Lettuce	Sclerotinia
Stone fruit	Brown Rot & post harvest dip
Strawberries	Botrytis
Tomatoes	Sclerotinia & Botrytis

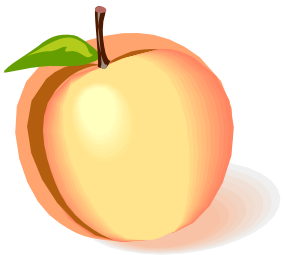
Procymidone is NOT to be used in the home garden for any purpose.

Legal Uses that have changed

Stone fruit: For control of blossom blight only- ***DO NOT APPLY AFTER SHUCK FALL.***
Grapes: may be used for botrytis control ONLY in grapes for wine production.

Some withholding and Re-entry periods have also changed. Consult the new label.

For more information please contact your chemical dealer or your NSWDPI horticulturist.



National Summerfruit IPDM Manual Underway

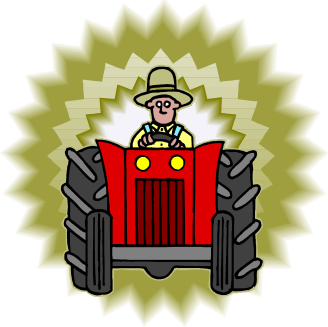
Dr Shane Hetherington,
NSW DPI, Orange

The development of a National Integrated Pest and Disease Management (IPDM) strategy for summerfruit orchards is well under way. During 2005 all orchardists who pay a levy to Summerfruit Australia Limited will receive a copy of the National IPDM Manual. The manual will provide information on how to control the nine most troublesome insect pests and the nine most troublesome diseases in an IPDM orchard. It will also contain information specific to your region, some general principals on establishing and maintaining an IPDM orchard and a section on management of birds in orchards.

The manual is the result of co-operation between Australian summerfruit orchardists, researchers and extension specialists. During the information gathering phase of the strategy, 66 peach orchardists, 65 nectarine orchardists, 50 plum orchardists and 31 apricot orchardists from around Australia were asked what their major pest and disease problems were. This series of interviews took place before and after the 2003/04 fruit season. Many of Australia's orchard regions were in the grip of a long-running drought. The interviewees were asked to compensate for the possible reduction in pest and disease problems due to the drought by recalling their problems from up to 10 years ago. This information was then used to make sure that the manual contained the information which was most relevant to Australian orchardists.

The manual will provide the most up-to-date information on pest and disease management from Australia and overseas.

A draft of the manual will be ready early in 2005. It's important to make sure that the manual contains practical advice which will be helpful to the industry. Orchardists have been involved in every stage of production and the draft will be sent out to a group of orchardists for their suggestions on how to improve it.



Spray Safely this Summer

Julie Dart
District Horticulturist
NSW DPI Tumut

During summer insects, diseases and weeds all leap into action. When properly applied agricultural chemicals can be a useful tool, but when things go wrong they often cause damage. Off target application caused by drift is a very common problem at this time of year.

Causing damage through spray drift is an offence under the pesticides act, and operators can be subject to substantial fines (up to $60,000 for an individual) as well as loss of credibility with neighbours.

Spray drift can cause:

contamination of land and water,
death or injury to non target animals, birds, fish and insects,
damage to susceptible crops and plants in the environment,
residues in livestock and food crops and
harm to people and property

The risk of drift depends on several factors:

1) **Droplet size**: Small droplets drift more than larger ones. Always use nozzles that apply the largest droplet size suitable to the task. Avoid the temptation to crank up the pressure and speed to get a spray out quickly. It's a guaranteed recipe for drift (as well as poor coverage).

2) **Temperature:** This affects the rate of evaporation, especially in water based sprays. Evaporation can quickly reduce droplet size before it reaches the target, increasing the risk of drift. Sprays should not be applied when air temperatures exceed 30 C. Temperature warning statements are often found on the chemical label.

Some formulations of chemicals such as esters can change from liquid to gas form at high temperatures (volatilisation), meaning that a sprayed out chemical can turn to vapour and move off the target to a different location. When ester formulations are used as herbicides, tree damage can occur in this way.

3) **Humidity:** Also affects droplet size and drying time. High humidity is useful to stop water based spray droplets from evaporating too quickly. On hot days low humidity accelerates evaporation. Sprays should not be applied on hot days when the humidity falls below 45%. Check chemical labels for warnings.

4) **Distance to target**: The closer spray droplets are released to the target, the less chance there is of drift. Application equipment that is set too far from the target provides more opportunity for droplet size to decrease and for wind to carry them away. Aerial spraying has a greatly increased risk of drift due to this factor alone. On powered sprayers, nozzles that do not direct spray onto the target need to be adjusted or be turned off.

5) **Wind**: Both speed and direction strongly influence where sprayed droplets land. When applying sprays some air movement is useful to direct spray droplets into a crop; hence the popularity of air blast sprayers in orchards and air assisted booms in broad-acre crops. The effective wind speed depends on the target**.** In general, sprays should not be applied when wind speed exceeds 15km/hr. In the case of bare ground and fallow situations, the critical wind speed for drift is much lower, as there is less vegetation to catch all of the spray.

Calm weather can also cause problems. A temperature inversion occurs when air close to the ground cools faster than the air above it. Inversions are more likely to occur in the early morning and late afternoon on a still day. Sprays applied under inversion conditions can get stuck in the layer of warmer air and not make the target. Trapped spray can then be moved well off the farm as a fog when a breeze occurs, causing drift.

Control the risks on the job:

1) Attend accredited chemical user training and keep your certificate up to date. This will become law by September 2005.

2) Assess sensitive areas on your farm and nearby before you prepare to spray. Consider developing buffer zones and a management plan.

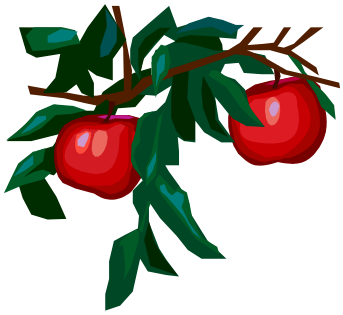
3) Check the weather conditions. Don't spray if the weather conditions are wrong.

4) Keep records! It is a legal requirement to keep a written record when agricultural chemicals are applied. As part of this, weather conditions such as temperature, wind speed, humidity and wind direction must also be recorded.

5) Choose the most appropriate type of application equipment for the job, to reduce the risk of drift.

6) Regularly calibrate sprayers to check that they are operating efficiently, check pressure gauges are correct and keep an eye on travel speed when spraying.

For more information on spraying or chemical user training, contact your local horticulturist.



Fire Blight Workshop Report - Bologna, Italy

Dr Shane Hetherington
Plant Pathologist
NSW DPI Orange

Because of the possibility of apple imports from New Zealand, the bacterial disease fire blight has become a much talked about topic during 2004. While Australia does not have this devastating disease, New Zealand does. The risk of disease incursion associated with these imports is a serious concern to the Australian industry.

Because we are free of the fire blight very few of our local plant pathologists have any experience. Because of this NSW Department of Primary Industries and the NSW apple industry decided it was prudent to send me to Bologna in northern Italy to attend the 10th International Workshop on fire blight in July.

The Workshop

There were 151 delegates to the workshop from 28 countries. The largest delegations came from the USA, Italy, Australia and Germany.

The workshop was divided into six sessions

- Spread, Economics, Detection & Quarantine;
- Epidemiology & Prediction;
- Control Strategies;
- Biology & Genetics;
- Host, Pathogen Interactions and
- Breeding for resistance & transgenics

Issues of direct relevance to the Australian Apple & Pear Industry

Several papers were presented which were directly relevant to the Australian apple and pear industry

Points of interest to the Australian Apple and Pear industry from papers presented at the 10th International Fire Blight Workshop

The cost of an incursion would be substantial.

Diagnosis of suspected fire blight should not rely on the use of a single diagnostic protocol as false negatives are possible.

The disease can infect a wide range of commonly planted ornamental species. A pre-emptive campaign to reduce roadside plantings of hawthorn etc. should be undertaken by industry.

A centralised repository for fire blight information will provide industry with a valuable source of current information.

The cost of eradication

Following detection the disease has only been successfully eradicated in two regions – Australia and Aragorn, Spain. A paper was presented by Rodoni *et al.* which estimated the overall cost of the incursion in Melbourne's Royal Botanic Gardens in 1997.

Actions	**Cost (million $'s Aust)**
National orchard & urban surveys, eradication programs, diagnostics and media management	2.2
Interstate trade restrictions (cost to Victoria)	7
International trade, delay of two years in Tasmanian access to Japanese markets	10
Research to determine diagnostic protocols and contingency plans	1
	Total 20.2

The paper then used economic model to develop the projected costs associated with a number of hypothetical incursion scenarios in the Goulburn Valley.

The first scenario assumes an outbreak resulting in 30% yield losses which is eradicated in four years. The model predicts a financial loss of AUD 110 million. The second scenario assumes losses of 50% for pears & 20% for apples and that the outbreak cannot be eradicated. This results in losses of AUD 900 million in net present value.

Diagnosis

In an Australian context, accurate diagnosis is required in the event of a suspected incursion. A number of papers presented evaluations of existing and new detection systems. A European project headed by a Spanish group compared commonly used diagnostic techniques.

- Isolation in three media (Kings B, SNA & CCT);
- direct tissue print ELISA;
- enrichment DASI – ELISA;
- immunolfluorescence;
- PCR and
- nested PCR

Known samples were distributed to 10 plant health laboratories and techniques evaluated on the basis of the number of false positives and false negatives generated. Full results of this study are available at: http://www.csl.gov.uk/science/organ/ph/diagpro.

A number of novel techniques were presented which require further evaluation.

A Canadian group (P. Solberg et al; SholbergP@agr.gc.ca) has developed reverse dot blot hybridization technique with an extremely low (10 cfu) detection threshold. The technique also seems to give good specificity to the fire blight bacterium.

A group at Geneva have developed an immunoliposome technique for pre-systematic detection of the fire blight bacterium. There was some concern with the specificity of this test.

An interesting paper was presented on the isolation of an isolate of the fire blight bacterium from a fully infected Hawthorn. This isolate did not have a pEA29 plasmid. Plasmid pEA29 was assumed to be ubiquitous in the fir blight bacterium. PCR protocols for diagnosis of the fire blight bacterium commonly rely on primers derived from this plasmid. This raises the possibility of false negatives arising from PCR diagnosis. A comment from the floor indicated that while this condition is rare, it is not unknown.

Alternative hosts

Several countries have implemented planting and production restrictions on ornamental and environmental plant species which are hosts of the fire blight bacterium.

In Switzerland, planting bans have been placed on all cotoneaster, *Photinia davidiana* and *P. nussia*.

Another paper highlighted the difficulties associated with restricting alternative host species in production regions in Italy where fire blight hosts occur naturally.

No Australian native species are likely hosts of the fire blight bacterium. An opportunity exists for the precautionary, pre-emptive removal of alternative host species in production regions.

Development of a fire blight web site

A web-site is under development at Cornell University which is designed to be a central repository for all information on fire blight. This will include information on the new fire blight bacterium gene-mapping project. Industry will be advised when this web-site is operational.

Other issues to be considered in the import of apples

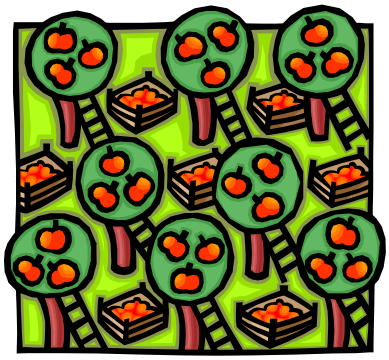
Viable but non-culturable (VBNC)

Copper bactericides often used to control fire blight induce a viable but non-culturable condition in the fire blight bacterium. These non-culturable bacteria would not have been detected in studies reliant on culturing to detect epiphytic populations.

Starlings

Starlings may have a role in moving the fire blight bacterium from whole infected fruit to other hosts.

If you wish to discuss any of the presentations from the workshop or any other issues related to fire blight contact Shane Hetherington 6361 9401.



Leaf mineral concentrations in stone fruit are affected by both root temperatures and phenology

Peter Malcolm,
District Horticulturist
NSW DPI, Windsor

Many orchardists regularly use leaf analyses to assess the nutrient status of their peach and nectarine trees. However many are unaware that such leaf mineral concentrations are heavily influenced by both plant phenology (normal seasonal changes in the plants life cycle) and root zone temperatures (RZT). Therefore it is important, that leaf samples for mineral analysis be taken at the appropriate time of the season, so that valid comparisons can be made with the established standards for leaf mineral content.

Recent trials at UWS (Hawkesbury) with the peach, Green Leaf Nemaguard demonstrated that in stone fruit, there are considerable seasonal differences in the concentration of the various mineral nutrients in leaves, with concentrations varying depending on the plant's phenological stage.

Figures 1 – 3 illustrate the differences in leaf concentrations of nitrogen (N), phosphorus (P) and potassium (K) at two different phenological stages namely at bud-burst (BB) and also during mid season when plants are actively growing (AP).

Leaf concentrations of these particular nutrients are significantly higher shortly after vegetative bud-break than they are in mid season when the plants have been actively growing for several months. The same observation has also been reported in another deciduous crop, kiwifruit, where there are also considerable differences in plant phenology and where leaf concentrations of these nutrients are also naturally much higher shortly after vegetative bud-break.

Figures 1-3. Mean (n =10) concentrations (mass/mass) of nitrogen, phosphorus and potassium for the peach, Green Leaf Nemaguard, after six weeks of being subjected to different RZT treatments. The plants were either actively growing at the time the treatments were applied or were at bud-break. Within each graph, means accompanied by the same letter are not significantly different (P ≤ 0.05).

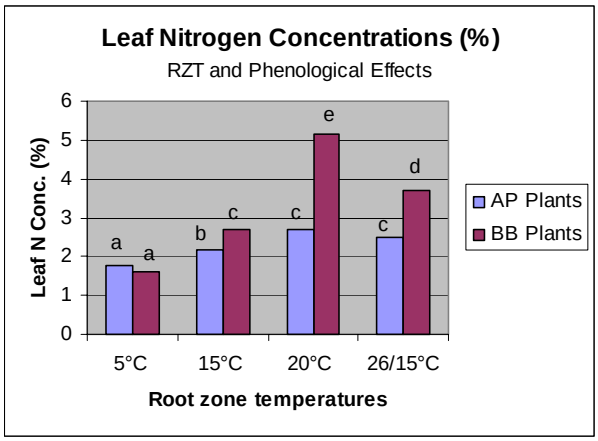


Figure 1. The effects of RZT and plant phenology on leaf N concentrations

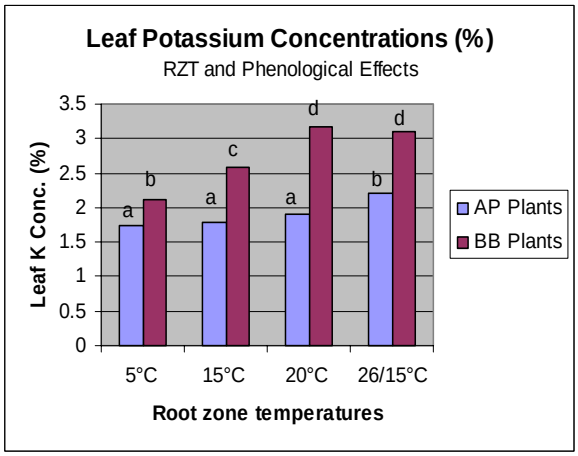


Figure 2. The effects of RZT and plant phenology on leaf K concentrations

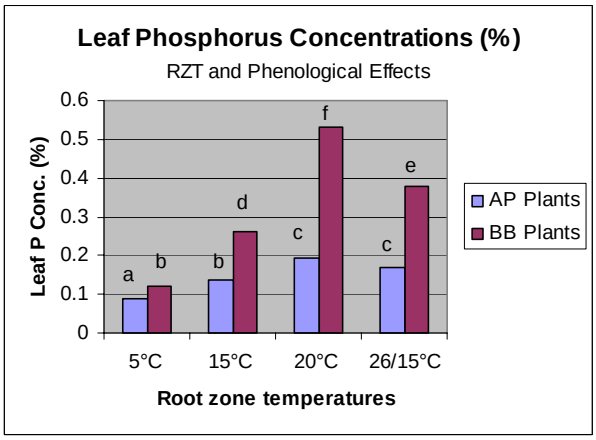


Figure 3. The effects of RZT and plant phenology on leaf P concentrations

This means that in peaches and nectarines, concentrations of N, P and K in leaf samples taken soon after vegetative bud-break can appear to be excessively high, sometimes even at toxic levels, when compared with the standards established for leaf samples taken in late January, the normal time for such samples to be taken.

From a growers perspective this highlights the importance of taking leaf samples at the appropriate time of the year (phenological stage) for analysis and comparison with established standards. If samples are taken at other times of the year are compared with the established standards, the conclusions drawn from such comparisons may give a false impression of the mineral nutritional status/health of the plant.

The other finding that came out of the UWS (Hawkesbury) trials, was that in peaches, root zone temperatures (RZT) had a significant impact on leaf mineral nutrition and in particular the leaf concentrations of nitrogen, phosphorus and potassium at different phenological stages. This was despite air temperatures for all treatments being the same. In both actively growing and bud-break plants (plants exiting dormancy) there was a positive correlation between RZT and leaf concentrations of these nutrients such that at RZTs of 20°C leaf concentrations of nitrogen, phosphorus and potassium were

much greater than at lower RZTs (Figures 1 to 3). In all trials, diurnal variations in RZTs also affected leaf concentrations of these nutrients (Figures 1 to 3).

Figure 4 At low root temperatures, peach plants showed symptoms of mineral deficiency.

Changes in leaf colour were also associated with differences in leaf mineral concentrations, in both bud-break and actively growing plants. This was particularly so for bud-break plants. When plants were exposed to lower RZTs, leaf nutrient levels were often so low that plants frequently showed typical nutrient deficiency symptoms such as leaf discoloration and interveinal chlorosis (Figure 4). These symptoms were particularly severe in bud-break plants exposed to low RZT.

Normally in the spring, soil temperatures lag behind air temperatures. Low soil temperatures during vegetative bud-break reduce the ability of the plant to absorb/mobilize mineral nutrients, consequently affecting leaf mineral nutrition, leaf development and prolonging the time the plant is dependant upon stored reserves for fruit development rather than photosynthates produced by the leaves. This is particularly important in the early stages of fruit development, and, may influence fruit size and yields. For this reason, cultural practices which raise RZTs, especially in those peach and nectarine varieties which flower early, may be quite beneficial in those districts which normally experience low spring RZTs.

In summary

Because leaf nutrient levels vary with plant phenology, it is important that leaf samples for analysis be taken at the appropriate time if they are to be compared with established standards to establish nutrient deficiencies, normality or toxicities.

If orchardists are measuring leaf nutrient levels from year to year for monitoring purposes, then leaf analyses need to be taken at the same time of the season to obtain valid comparisons between seasons.

As leaf mineral concentrations are affected by RZTs, orchard cultural practices which increase soil temperatures in the spring and/or which reduce diurnal variations in soil temperatures, such as the selective use of mulches, may have considerable beneficial effects on the mineral status of plants.